

**What is claimed is :**

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5 1. Gyrolaser to measure the angular speed or the relative angular position according to a set rotation axis, comprising at least:

- a solid-state amplifying medium;
- a slaving device including at least a first optical assembly made up of a first linear polarizer, a first nonreciprocal optical rotator and an optical element, said optical element being either a reciprocal optical rotator or a birefringent element, with at least one of the effects or the birefringence being adjustable;
- a measuring instrument ;
- a ring-shaped optical cavity comprising a second optical assembly made up successively of a first quarter waveplate, a second nonreciprocal optical rotator and a second quarter waveplate, whose main axes are perpendicular to those of the first quarter waveplate;

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15 such that a first linearly polarized propagation mode can propagate in a first direction in the cavity, and a second propagation mode polarized linearly parallel to the first can propagate in the opposite direction in the cavity, with  
20 the main axes of the first quarter waveplate and the second quarter waveplate tilted 45 degree relative to the linear polarization directions of the propagation modes, the optical frequencies of the two modes being different.

25 2. Gyrolaser according to claim 1, wherein the cavity comprises a second linear polarizer whose axis is parallel to that of the first linear polarizer and positioned such that the optical assembly consisting of the first nonreciprocal optical rotator and the optical element are placed between the first and the second polarizer.

30 3. Gyrolaser to measure the angular speed according to a set rotation axis, comprising at least:

- a solid-state amplifying medium ;
- a measuring instrument ;
- a ring-shaped optical cavity comprising:
  - a slaving device comprising at least a first optical assembly made up of a first linear polarizer and an adjustable nonreciprocal optical rotator ;
  - a second optical assembly made up successively of a first quarter waveplate, a second nonreciprocal

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optical rotator and a second quarter waveplate, the axis of the first waveplate being tilted by an angle other than 45 degrees relative to the polarization direction of the linear polarizer, and the axis of the second waveplate being tilted approximately 45 degrees relative to the polarization direction of the linear polarizer;

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such that a first propagation mode can propagate in a first direction in the cavity, and a second propagation mode can propagate in the opposite direction in the cavity, the optical frequencies of both modes being different.

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4. System to measure the angular speeds or relative angular positions along three different axes, comprising three gyrolasers according to one of the above claims, oriented in different directions and mounted on a common mechanical structure.

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